



## Subject card

|   |  |  |                                     |            |  |         |     |
|---|--|--|-------------------------------------|------------|--|---------|-----|
| Subject name and code                       | Fundamentals of Machine Design II, PG_00050280   |  |                                     |            |  |         |     |
| Field of study                              | Mechanical Engineering   |  |                                     |            |  |         |     |
| Date of commencement of studies             | October 2022   | Academic year of realisation of subject                  |                                     |            | 2023/2024  |         |     |
| Education level                             | first-cycle studies  | Subject group  |                                     |            | Obligatory subject group in the field of study<br>Subject group related to scientific research in the field of study |         |     |
| Mode of study                               | Full-time studies  | Mode of delivery   |                                     |            | at the university  |         |     |
| Year of study                               | 2  | Language of instruction                                  |                                     |            | English  |         |     |
| Semester of study                           | 4  | ECTS credits   |                                     |            | 8.0  |         |     |
| Learning profile                            | general academic profile   | Assessment form  |                                     |            | exam   |         |     |
| Conducting unit                             | Department of Machine Design and Vehicles -> Faculty of Mechanical Engineering and Ship Technology   |  |                                     |            |  |         |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor   | dr inż. Grzegorz Rotta                                   |                                     |            |  |         |     |
|   | Teachers   |  |                                     |            |  |         |     |
| Lesson types and methods of instruction     | Lesson type  | Lecture  | Tutorial                            | Laboratory | Project  | Seminar | SUM |
|   | Number of study hours  | 30.0   | 30.0                                | 0.0        | 30.0   | 0.0     | 90  |
|   | E-learning hours included: 0.0   |  |                                     |            |  |         |     |
| Learning activity and number of study hours | Learning activity  | Participation in didactic classes included in study plan | Participation in consultation hours |            | Self-study   | SUM     |     |
|   | Number of study hours  | 90   | 8.0                                 |            | 102.0  | 200     |     |
| Subject objectives                          | <p>Presentation of the general theoretical foundations (features, functions, constructional variants, application, etc.) regarding typical groups of machine parts, such as: screw joints, welded joints, shafts and axles, couplings, gears, brakes, bearings, drives, flexible elements.</p> <p>Acquainted with the basic calculation methods of typical machine elements and how to select catalog parts for the designed technical device</p> <p>Learning to create technical documentation effectively using theoretical knowledge and CAD software</p> |  |                                     |            |  |         |     |

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| Learning outcomes               | Course outcome  | Subject outcome  | Method of verification   |
|                                 | K6_W04  | Possesses knowledge on mechanics, including the processes of modelling mechanical systems, statics, kinematics and dynamics of rigid objects and basic knowledge on vibrations   | [SW1] Assessment of factual knowledge  |
|                                 | K6_U11  | Is able to analyse the operation of devices and compare the construction solutions applying usage, safety, environmental, economic and legal criteria  | [SU2] Assessment of ability to analyse information<br>[SU4] Assessment of ability to use methods and tools |
|                                 | K6_W08  | Possesses basic knowledge including the methodology of designing machine parts, mechanical devices, selection of construction materials, manufacturing and operation, with the lifetime cycle  | [SW1] Assessment of factual knowledge  |
|                                 | K6_U07  | Is able to design a typical construction of a mechanical device, component or a testing station using appropriate methods and tools, adhering to the set usage criteria  |  |
|                                 | [K6_U03] is able to identify, formulate and develop the documentation of a simple design or technological task, including the description of the results of this task in Polish or in a foreign language and to present the results using computer software or other aiding tools   | Is able to identify, formulate and develop the documentation of a simple design or technological task, including the description of the results of this task in Polish or in a foreign language and to present the results using computer software or other aiding tools | [SU1] Assessment of task fulfilment  |
| Subject contents                | Presentation of the general theoretical foundations (features, functions, constructional variants, application, etc.) regarding typical groups of machine parts, such as: screw joints, welded joints, shafts and axles, couplings, gears, brakes, bearings, drives, flexible elements. Acquainted with the basic calculation methods of typical machine elements |  |  |
| Prerequisites and co-requisites | Basic knowledge of mechanics, strength of materials, technical drawing, materials science and any CAD program   |  |  |
| Assessment methods and criteria | Subject passing criteria  | Passing threshold  | Percentage of the final grade  |
|                                 | Design projects   | 56.0%  | 30.0%  |
|                                 | Final exam  | 56.0%  | 40.0%  |
|                                 | Tests   | 56.0%  | 30.0%  |
| Recommended reading             | Basic literature  | A set of scripts from the Basics of Machine Design published by the Gdańsk University of Technology  |  |
|                                 | Supplementary literature  | - A set of books "Basics of Machine Design" published by PWN, Warsaw<br><br>- "PKM, t. I, II, III" edited by M. Dietrich, PWN, Warsaw<br><br>- Any works on the "Basics of Machine Design" in Polish and English   |  |
|                                 | eResources addresses  |  |  |

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| <p>Example issues/<br/>example questions/<br/>tasks being completed</p> | <p>- determining the element strength at a given load (general technical constructions, bolted joints, welded joints, shafts and axles)- determining the minimum dimensions of an element for specific operating conditions (general technical constructions, screw joints, welded joints, shafts and axles)- determining the maximum load of an element for given dimensions (general technical constructions, bolted joints, welded joints, shafts and axles)- determining the durability of parts, e.g. rolling bearings- selection of components for the designed simple machine (fasteners, bearings, other catalog elements) or mechanical devices (drives, e.g. motors, clutches, gears, bearings and others)</p> |
| <p>Work placement</p>   | <p>Not applicable</p>  |